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Development Strategy for Requirement of ICT in Learning of Comprehensive Regional Higher Education Institutes: Comparing Undergraduates belong to Different School

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Abstract

Information and communication technology (ICT) has fundamentally transformed the way information is captured, processed and transmitted. Higher education institutes need ICT to facilitate the exchange of ideas and information about science and technology. However, in most Chinese universities, ICT was deployed mainly to automate ordinary tasks. In china, many comprehensive regional higher education institutes (CRHEIs) have been founded from 2005. Students in those CRHEIs become more and more. Those CRHEIs should improve their quality of teaching for their student being good workers. In this paper, we analyses ICT–based learning issues from undergraduates of different school in Linyi University. The research provides ICT strategy which CRHEIs authorities should take in order to properly integrate ICT in their university.

*Keywords :*Information and communication technology; ability gaps; development strategy

1.Introduction

Information and communication technology (ICT) has fundamentally transformed the way information is captured, processed and transmitted [1]. Higher education institutes need ICT to facilitate the exchange of ideas and information about science and technology [2]. ICT offer new methods for teachers to interact with each other and with their students [3]. ICT is used not only for administrative purposes but also for delivering teaching materials for distant and on-campus students in developed countries [4]. While internet usage in institute has become a standard, teachers will become more informed, more interactive, and more confident in the usage of various kinds of hardware and software to encourage and challenge students. Students can also enroll and pursue their studies while still working

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without any need of visiting a university campus [5]. This helps students to continue their learning beyond the classroom.

In china, many comprehensive regional higher education institutes (CRHEIs, mainly be regional university) have been founded from 2005. Students in those CRHEIs become more and more. Those CRHEIs should improve their quality of teaching.

Whereas in most Chinese regional higher education institutes, ICT were deployed mainly to automate ordinary tasks such as those of student records systems and administrative support services. Some teachers lag far behind the others in adopting internet innovation [6]. However, change in professional domain, internet innovation, and teaching methods is ineluctable. We should be effective and ensure the adoption of all new technologies, as they become available. ICT-skilled teachers in CRHEIs should adopt right pedagogical tools and practices in their teaching and enable their students embrace these new technologies.

In this study, learning with/without the help of ICT in CRHEIs is explored. Their ability gaps in tackling and solving problems are recorded, and therefore proper strategy or mechanism can be figured out to reduce these ability gaps to a minimum. In this research, the undergraduate of school of life science and school of Chinese language and literature in Linyi University are asked to devise development strategy with the help of normative Delphi technique. The purpose of these development strategies is to increase learners' experiences by the use of ICT in CRHEIs, and therefore improve output of CRHEIs.

In this paper, as the way of [7], we get the following data of School of Chinese Language and Literature in Linyi University. There are 227 undergraduates matriculated in 2008 in school of Chinese language and literature. They belong to 4 degree programs which are: Biological Science (for future teachers), History, Cultural industry management, and Compiling and publishing. They have studied for 2 years in Linyi University. According to normative Delphi technique, a questionnaire was prepared and hand-delivered to the staff, and 154 of panelists answered the questionnaire. Within next 2 months, these 154 members complete other questionnaires for 3 rounds. The same group was asked to devise a development strategy that CRHE authorities should take in order to integrate ICT in their CRHEIs.

We get the following data of School of Life Science in Linyi University. There are 318 undergraduates matriculated in 2008 in college of Life Science. They belong to 6 degree programs which are: Biological Science (for future teachers), Biotechnology, Pharmaceutical technology, Food science, Zoological medicine ，and Park and garden. They have studied for 2 years in Linyi University. According to normative Delphi technique, a questionnaire was prepared and hand-delivered to the staff, and 262 of panelists answered the questionnaire. Within next 2 months, these 262 members complete other questionnaires for 3 rounds. The same group was asked to devise a development strategy that CRHE authorities should take in order to integrate ICT in their CRHEIs.

The organization of this paper is as follows. In section Ⅰ, we propose the introduction of ICT in CRHEIs. In section II, we discuss the data analysis of Linyi University. In section III, we present our conclusion that development strategy for requirement of ICT proposed by panelists.

2.Data Analysis

Data showing ability gaps obtained through the questionnaires from undergraduates school of Chinese language and literature is shown in Table 1. Please refer to Table 1 for issues.

Table 1 Ability gaps of School of Chinese Language and Literature

	issues	Ability gaps
1	Learns Textbooks	2.78
2	Finishing Homework/Sharing Material	1.68
3	Communication with teachers and students	2.02
4	Academic Research and Social Networks	3.49

5	Use of Common ICT tools	0.05
6	Rely on ICT in CRHEIs	0.89
7	Use of ICT in CRHEIs	0.89
8	Get help by ICT in CRHEIs	0.98
9	ICT Demand in CRHEIs	1.58
10	ICT Supply in CRHEIs	2.01

Data showing ability gaps obtained through the questionnaires from undergraduates school of life science is shown in Table 2. Please refer to Table 2 for issues.

Table 2 Ability gaps of School of Life Science

	issues	Ability gaps
1	Learns Textbooks	2.58
2	Finishing Homework/Sharing Material	1.65
3	Communication with teachers and students	1.83
4	Academic Research and Social Networks	3.45
5	Use of Common ICT tools	0.05
6	Rely on ICT in CRHEIs	0.92
7	Use of ICT in CRHEIs	0.92
8	Get help by ICT in CRHEIs	0.95
9	ICT Demand in CRHEIs	1.70
10	ICT Supply in CRHEIs	2.86

1. A student learns textbooks by reading online, searching information from internet after class lecture. High ability gap (2.78) for Chinese Language and Literature and ability gap (2.58) for Life Science are recorded which shows levels of students of CRHEIs using ICT for these tasks.

2. For finishing their homework, thesis, sharing material between students using ICT, ability gap (1.68) for Chinese Language and Literature and ability gap (1.65) for Life Science are obtained.

3. For communication between teachers and students using ICT, ability gap for Chinese Language and Literature and for Life Science are 2.02 and 1.83 respectively.

4. For finding research information, communicating with researchers, quest for knowledge using learner forums, ability gap (3.49) for Chinese Language and Literature and ability gap (3.45) for Life Science are obtained.

5. Very small ability gap of 0.05 for both Chinese Language and Literature and Life Science is recorded for use of common ICT tools such as MS office, web browsers, e-mail, search engines etc.

6. Regarding how much should students' faculty of CRHEIs rely on ICT, low ability gap (0.89) for Chinese Language and Literature and low ability gap (0.92) for Life Science are recorded respectively.

7. Regarding how much should students' faculty of CRHEIs use ICT, low ability gap (0.89) for Chinese Language and Literature and low ability gap (0.92) for Life Science are recorded respectively.

8. Regarding how much help students faculty of CRHEIs get while using ICT , low ability gap (0.98) for Chinese Language and Literature and low ability gap (0.95) for Life Science are recorded respectively.

9. Ability gap of 1.58 for Chinese Language and Literature and ability gap of 1.70 for Life Science are measured for the issue of demand for ICT in CRHEIs of PRC.

10. Ability gap of 2.01 for Chinese Language and Literature and ability gap of 2.86 for Life Science are recorded for ICT supply in response to its demand in CRHEIs.

Students usually perform a number of tasks. A student must finish his homework, thesis, sharing material between students using ICT tools and applications. If a student is effective at communication with teachers and other students, his tasks will become much easier. There are many ICT tools and applications that a student can use while sharing material with other students.

In almost all aspects relating these learning issues about CRHEIs in PRC, similar ability gaps are measured about undergraduates belong to different school in Linyi University. In this study, Email and word processing are the two learning tools that most students are quite familiar with and have high degree of experience with. Fewer students have knowledge of and experience in software presentation, multimedia and distance learning. It is not popular to establish a mutual dialogue and communication between staff and students although it is a popular tool for use between staff and other colleagues.

The main causes of such significant gaps are due to lack of funding, unavailability of resources and lack of attitude or vision etc. To-date most universities are still holding national status and heavily depend on their governments for funding.

The spread of ICT is considered as necessary in CRHEIs of developing countries; thus they can drive in pedagogical challenges coming from latest development. However, few strategies have been devised to solve these issues in PRC. Accordingly in this study we try to devise a strategy including some important measures for ICT enhancement.

3.Conclusions

Some development strategies for requirement of ICT in engineering learning are proposed by undergraduates matriculated in 2008 of School of Chinese Language and Literature and School of Life Science at Linyi University.

The University must assist in support for ICT adaptation using both formal and informal methods to create a learning system. Education network site populated with relevant learning resources for curriculum purposes needs to be developed.

It is necessary for CRHEIs to enhance their ICT in order to participate effectively in the global information age. CRHEIs ought to seriously consider better ways of proving their worth and usefulness in providing a student-centered, intellectually stimulating and technologically advanced teaching, learning and research environment through the use of ICT.

Teaching staff should be supported to use innovative methods of teaching in their routine work. ICT training centers that fulfill training needs of students needs to be established.

Every member of the university community, that is, management, academic staff and non-academic staff should understand the rationale behind using ICT, which is for themselves, for the faculties they serve and the University at large.

Teams comprising of teachers, educational advisors, and library staff need to be developed which develop course-based education content. Academic members of staff must be keen to collaborate with students, other colleagues in and outside the campus.

Computer level of 3:1 students-computer ratio should be reached. Local internet needs to be developed and consummated. Management ought to improve the low bandwidth that hinders smooth Internet services. Students ought to be encouraged to use internet in their routine tasks. A mutual dialogue and communication needs to be established between staff and students as this for use between staff and other colleagues. An open and mutual understanding of trust between staff and students needs to be cultivated.

References

[1] M. King, B. Zhu, and S. Tang, “Optimal path planning,” *Mobile Robots*, vol. 8, no. 2, pp. 520-531, March 2001.

[2] Eyitayo, Oduronke T, Ogwu, Francis J, Ogwu, Edna N, Information Communication Technology (ICT) Education in Botswana: A Case Study of Students' Readiness for University Education, Journal of Technology Integration in the Classroom, Summer2010, Vol. 2 Issue 2, p117-130.

[3] “Information and Communication Technology Strategic Plan, 2005-06 to 2009-10” University of Oxford, Retrieved August 2009, from:http://www.ict.ox.ac.uk/strategy/plan/ICT_Strategic_Plan_March2007.pdf

[4] Bader, M. B, Roy, S, Using Technology to Enhance Relationship in Interactive Television Classroom, Journal of Education for Business, Jul/Aug/99, Vol. 74 Issue 6, P357-64.

[5] Groves, M. M, Zemel, P. C, Instructional technology adoption in higher education: An action research case study, International Journal of Instructional Media, 2000, Vol 27 Issue 1, 57-64.

[6] Katz. R, Blustain. H, Duderstadt. J, Farrington. G, Goldstein. P, Graves. W, Dancing with the devil: Information technology and the new competition in higher education, San Francisco: Jossey-Bass Publishers,1999.

[7] P. Deshpande, "Connected – where next?: A strategy for the next phase in the development of education ICT in Bournemouth" Retrieved August 2009, from: http://www.bournemouth.gov.uk/Library/PDF/Education/Education_ICT_Strategy_2004_to_2009.pdf

[8] Z. A. Shaikh, "Usage, acceptance, adoption, and diffusion of information & communication technologies in higher education: a measurement of critical factors" Journal of Information Technology Impact vol. 9(2), July 2009, pp. 63-80.